

## CHAMOIS FOR ATHLETIC SHORTS HAVING RELATIVELY ELASTIC PORTION AND RELATIVELY INELASTIC PORTION

### DESCRIPTION

5   **[Para 1]**   Field of the Invention

**[Para 2]**   The present invention relates to chamois and, more particularly, to chamois having relatively higher elastic and relatively lower elastic or inelastic portions.

**[Para 3]**   Background of the Invention

10   **[Para 4]**   Cycling pants/shorts of various configurations have become popular because they provide some cushioning between the bicycle seat and the cyclist, and they minimize chafing of the body of the cyclist. Cycling shorts conventionally include an inner pad, or chamois as they are known in the art, located in the crotch  
15   and buttocks regions of the cyclist. Shorts and pants are used interchangeably in this application. While some chamois are composed of a number of pieces of flexible material that are stitched together, other chamois are formed of one piece of material. As used in this application flexible generally means  
20   pliable or bendable.

**[Para 5]**   One conventional chamois is described in United States Patent No. 5,271,101, titled CYCLING SHORTS WITH ANATOMICAL SEAT PAD, issued December 21, 1993, to Septh et al., incorporated herein by reference as if set out in full. The '101 Patent provides  
25   cycling shorts having a padded, three-layer, seat liner having a plurality of integrally formed and embossed break lines.

**[Para 6]**   While these early chamois provided some improvement and comfort, the early chamois, such as the '101 chamois, still caused irritation to the wearer. To reduce irritation, and provide  
30   increased comfort and durability, multiple density chamois were developed. Such multiple density chamois are described in United States Patent No. 6,687,917, titled CHAMOIS FOR CYCLING PANTS AND METHOD OF MAKING, issued February 10, 2004, to Forsyth et al. and United States Patent No. 6,565,702, titled the same, issued May  
35   20, 2003, to Forsyth et al., both of which are incorporated herein by reference. The multiple density chamois provided increased support in the areas where increased support was necessary, and

40 increased pliability where increased pliability was necessary. The multiple density chamois enhanced chamois performance, but still caused irritation to users.

45 **[Para 7]** Recently, a trend has begun where the chamois is constructed out of not just one or more density and/or thickness materials, but elastic materials as well. Elastic as used in this application generally means stretchable, unlike the use of the term flexible, which refers to pliable. Using elastic and flexible material allows the chamois to stretch and bend with the user's body tending to reduce irritation.

50 **[Para 8]** While using elastic material provided some benefits, the support material tends to breakdown after repeated stretch and retraction of the foam. Thus, it would be desirable to provide a chamois that corrected this and other problems with the prior art.

**[Para 9]** Summary of the Invention

55 **[Para 10]** To attain the advantages and in accordance with the present invention, a chamois is provided. The shoe comprises a garment facing side and a body facing side. The chamois further comprises at least two materials, one material being a relatively elastic material and the second material being a relatively inelastic material.

60 **[Para 11]** The foregoing and other features, utilities and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of the invention as illustrated in the accompanying drawings.

**[Para 12]** Brief description of the DRAWING

65 **[Para 13]** The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the present invention, and together with the description, serve to explain the principles thereof. Like items in the drawings are referred to using the same numerical reference.

70 **[Para 14]** FIG. 1 is a body-side elevation view of a chamois constructed in accordance with an embodiment of the present invention;

**[Para 15]** FIG. 2 is an exploded, cross-sectional view of the chamois of FIG. 1;

75 **[Para 16]** FIG. 3 is an exploded, cross-sectional view of an alternative chamois constructed in accordance with another embodiment of the present invention;

**[Para 17]** FIG. 4 is an exploded, cross-sectional view of an alternative chamois constructed in accordance with another  
80 embodiment of the present invention; and

**[Para 18]** FIG. 5 is an exploded, cross-sectional view of an alternative chamois constructed in accordance with another embodiment of the present invention.

**[Para 19]** Detailed Description

85 **[Para 20]** The present invention will now be explained with reference to FIGS. 1 to 5. While the present invention is explained with particular reference to chamois for cycling shorts, one of ordinary skill in the art will recognize on reading the disclosure that the present invention has multiple uses and multiple  
90 configurations. In particular, the present invention would be useful in any multi-density system where at least a portion of the system needs to be elastic.

**[Para 21]** FIG. 1 illustrates a chamois 100 constructed in accordance with the present invention. Chamois 100 has a  
95 buttocks region 102 and an abdominal region 104. Buttocks region 102 has a plurality of buttocks support areas 106 defined by seams 108. Seams 108 may be embossed seams, welded seams, bonded seams, adhesive seals, stitched seams, or a combination thereof.

100 **[Para 22]** While chamois 100 is shown with two separate buttocks support areas 106, areas 106 could be connected into a single area 106 or each shown pad 106 could be split into multiple pad areas as a matter of design choice. Further, the overall shape of buttocks support areas 106 is a matter of design choice.

105 Moreover, as shown in FIG. 1, chamois 100 may contain additional support areas, such as, for example, abdominal support area 110. More, less, or different support areas are possible as a matter of design choice.

110 **[Para 23]** Referring now to FIG. 2, a cross-sectional view of chamois 100 about line 2-2 is shown. As shown, chamois 100 resides between a garment, such as cycling short 200 and a wearer, such as cyclist body 202. Chamois 100 comprises a

garment facing elastic cloth layer 204 situated proximate the short  
200. A relatively high elasticity foam layer 206 is provided on cloth  
115 layer 204 and generally traverses the entire chamois 100 although  
elastic foam layer 206 does not need to be contiguous. Elastic  
foam layer 206 may be comprised of a number of elastic or  
stretchable foams such as, for example, high density closed cell  
foam, low density open cell foam, combinations thereof, or the  
120 like. A plurality of foam pads 208 are arranged on elastic foam  
layer 206. Foam pads 208 comprise a relatively low elastic foam  
or an inelastic foam, such as, for example, high density closed cell  
foam, low density open cell foam, combinations thereof, or the  
like. As used herein, relatively inelastic generally means less  
125 elasticity than the elastic materials, which includes inelastic  
materials. For example, the relatively elastic portions of the  
chamois may experience a stretch of about 5% with complete  
recovery using a 2-lb weight to stretch the material. A stretch of  
about 5% means about a 5% change in the dimension (length,  
130 width, diagonal, etc.) being tested. Other relatively elastic  
portions may experience stretch of about 2% to 25% or more  
depending on the specific materials used for construction. The  
relatively inelastic portions typically have stretch values of less  
than 1 or 2% and as close to zero stretch as possible, but can  
135 have stretch values of up to about 5% less than the stretch of the  
relatively elastic portion. However, for relatively elastic portions of  
the chamois being around 20%, the relatively inelastic portion of  
the chamois should be around 5% or less. Also, foam pads 208  
may comprises single density foams, such as, for example, 60kg  
140 open cell foam that are generally known in the art, or the like, or  
multi-density foams, such as, for example, 60kg open cell foam and  
120kg closed cell foam that are generally known in the art, or the  
like. If support areas 106 and 110 comprise a single area, only  
one foam pad 208 would be provided.

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**[Para 24]** Finally a body side elastic cloth layer 210 is provided  
proximate the body. Cloth layer 210 may comprise a wickable,  
absorbable, or hydrophobic material as a matter of design choice.  
Cloth layer 210 generally traverses all of chamois 100. Optionally,  
150 portions 212 of cloth layer 210 (off-set in phantom) may be  
replaced with relatively low elastic or inelastic material  
substantially aligned with foam pads 208. Non-stretchable

synthetic leather provides one possible portion 212. Portions 212 could be contiguous with cloth layer 210. Alternatively, through  
155 holes 214 could be cut into cloth layer 210 and portions 212 could be arranged in through holes 214. Alternatively, portions 212 could reside on cloth layer 210 and be substantially aligned with foam pads 208.

**[Para 25]** Optionally, cloth layer 210 may contain anti-microbial  
160 material. Anti-microbial material is generally known in the art and will not be further explained herein. Instead of incorporating an anti-microbial material into cloth layer 210, a separate elastic anti-microbial material layer 216 may be provided.

**[Para 26]** Support areas, such as, for example, buttocks support  
165 areas 106 and abdominal support areas 108 are typically designed to provide support for the wearer's body. Ideally, the additional support is provided by a relatively high density foam pad 208, a relatively thicker foam pad 208, or a combination of a relatively denser foam pad and relatively thicker foam pad 208, although  
170 foam pad 208 could be the same density and thickness as foam layer 206. Moreover, foam pads may contain multi-density foams as described above.

**[Para 27]** As mentioned above, repeated stretching and  
175 contracting of foams increase the fatigue and accelerate the breakdown of the foam. This tends to decrease the overall effectiveness of the support areas, such as, buttocks support areas 106 and abdominal support areas 110. Providing pads 208 as relatively low elasticity and or inelastic materials reduces the stresses the foam experiences and inhibits the breakdown of the  
180 material, which tends to enhance the overall performance. Alternatively, providing relatively inelastic seams 108 and/or relatively inelastic portions 212 reduces the stresses as well. Combining relatively inelastic pads along with inelastic seams 108 and/or inelastic portions 212 would also reduce the stress.

**[Para 28]** Referring to FIG. 3, a chamois 300 is shown. Chamois  
185 300 is generally similar to chamois 100 above, and the similarities will not be re-explained herein. Chamois 300 has a plurality of foam pads 308 arranged on elastic foam layer 206. Foam pads 308 are substantially aligned with support areas, such as, for  
190 example, buttocks support area 106. Foam pads 308 may comprise either a relatively high or low elasticity foam, such as any

of the foams mentioned above. In this case where foam pads 308 are elastic, layer 210 has portions 312 comprising a relatively low elasticity or inelastic material, such as, for example, synthetic leather, are arranged as relatively low elasticity or inelastic constraints on the ability of foam pad 308 to stretch.

**[Para 29]** FIG. 4 shows another chamois 400 consistent with the present invention. Chamois 400 is similar to chamois 100 or 300, but elastic layer 206 contains a number of through holes 402 corresponding to the number of support areas, such as support areas 106. Foam pads 208 are aligned within through holes 402 instead of residing on elastic layer 206.

**[Para 30]** FIG. 5 shows another chamois 500. Chamois 500 is consistent with either chamois 100 or 300, and comprises cloth layers 204 and 210. Cloth layer 210 may have portions 212 designed with relatively low elasticity or inelastic material. Similarly, cloth layer 204 may have portions 512 (similar to portions 212 described above). Residing between cloth layers 204 and 210 is an elastic foam layer 506. Elastic foam layer 506 has a number of through openings 508 containing foam pads 510. Foam pads 510 comprise a relatively low elasticity or inelastic foam material and are substantially contained in foam layer 506.

**[Para 31]** Instead of openings 508, as shown in phantom in FIG. 5, elastic foam layer 506 could be replaced with two foam layers 512 arranged with foam pads 510 contained between the layers.

**[Para 32]** Finally, referring back to FIGS. 1 and 2, if cloth layer 210 did not include anti-stretch portions 212 and foam 208 was relatively high elasticity foam, constructing seams 108 out of a relatively low elasticity or inelastic material or construction could function to inhibit the stress on foams 208.

**[Para 33]** While the invention has been particularly shown and described with reference to embodiments thereof, it will be understood by those skilled in the art that various other changes in the form and details may be made without departing from the spirit and scope of the invention.